$$=2e^{\cos\theta}[\cos(\sin\theta)+i\sin(\sin\theta)]-2e^{-\cos\theta}[\cos(\sin\theta)-i\sin(\sin\theta)]$$

$$+\frac{e^{\cos\theta}}{2}\Big[\cos(\theta+\sin\theta)+i\sin(\theta+\sin\theta)\Big]+\frac{e^{-\cos\theta}}{2}\Big[\cos(\theta-\sin\theta)+i\sin(\theta-\sin\theta)\Big].$$

Now equating the real parts we have,

$$C=2e^{\cos\theta}[\cos(\sin\theta)]-2e^{-\cos\theta}[\cos(\sin\theta)]+\frac{e^{\cos\theta}}{2}[\cos(\theta+\sin\theta)]+\frac{e^{-\cos\theta}}{2}[\cos(\theta+\sin\theta)]$$

which is the required sum.

Also solved by *J. SCHEFFER*, and *G. B. M. ZERR*.

PROBLEMS FOR SOLUTION.

ALGEBRA.

132. Proposed by J. SCHEFFER, A. M., Hagerstown, Md.

Solve $2^x+3^y=4$; $5^x+6^y=7$.

133. Proposed by HARRY S. VANDIVER, Bala, Montgomery County. Pa.

A theory of Fermat. The sum of two integral fourth powers cannot be an integral square. [Cf. *Chrystal's Algebra*, Vol. II., page 535.]

*** Solutions of these problems should be sent to J. M. Colaw not later than May 10.

GEOMETRY.

161. Proposed by MARCUS BAKER, U. S. Coast and Geodetic Survey Office, Washington, D. C.

A circle, radius r, is inscribed in a triangle ABC. In the angles A, B, and C are inscribed circles each touching two sides and the inscribed circle. There are six such circles. The first group of three have their centers between the in-centers and the vertices, and the second group of three does not. Let r_a, r_b, r_c denote the radii of the first group. Then this well known relation holds: $r=\sqrt{(r_ar_b)}+\sqrt{(r_br_c)}+\sqrt{(r_cr_a)}$. Let R_a, R_b, R_c denote the radii of the second group. Then this relation holds:

$$\frac{1}{r}=\frac{1}{\sqrt{(R_aR_b)}}+\frac{1}{\sqrt{(R_bR_c)}}+\frac{1}{\sqrt{(R_cR_a)}}.$$

Required proof.

162. Proposed by J. D. PALMER, Providence, Ky.

Given the distances from the vertices of a triangle, ABC, to the center of the in-circle, to construct the triangle.

*** Solutions of these problems should be sent to B. F. Finkel not later than May 10.